PBR500 Series

AC-DC Power Supplies



500 Watts

- 450-500W Forced Cooled
- 350-400W Convection Cooled
- ITE & Medical (BF) Safety Approvals
- U-Channel 4" x 7" Package
- 5V Standby & 12V Fan Supply
- AC OK, Inhibit & Remote Sense
- Class B Conducted & Radiated Emissions
- 3 Year Warranty



The PBR500 series of AC-DC switching power supplies, in a package of just $4 \times 7 \times 1.7$ inches, deliver 450-500 watts of continuous power with forced air cooling or 350-400 watts with convection cooling. The units are constructed on a U-Channel for mechanical support and heat sinking. A cover and fan assembly can be added during manufacturing. They are designed for both ITE/Industrial and medical applications including those needing BF rated insulation with an operation altitude up to 5000 meters.

Dimensions:

PBR500:

7.0 x 4.00 x 1.70" (177.8 x 101.6 x 44.5 mm)

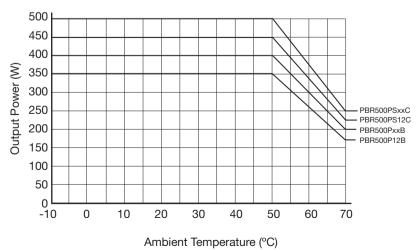
Models & Ratings

Output Voltage V1	Output C	Current V1	Standby Supply Fan Supply V2		Output Power		Ripple & Noise	Model Number ⁽¹⁾								
V I	Convection	Forced	- V2	vo -	Convection	Forced ⁽²⁾										
12 V	29.17 A	37.50 A	5.0 V / 0.5 A		350 W	450 \\	120 mV	PBR500PS12B								
15 V	23.34 A	30.00 A			350 W	450 W	150 mV	PBR500PS15B								
18 V	22.23 A	27.78 A		500/05 A 40.00/00 A			180 mV	PBR500PS18B								
24 V	16.67 A	20.84 A					240 mV	PBR500PS24B								
28 V	14.29 A	17.86 A		5.0 V / 0.5 A	12.0 V / 0.3 A	400 W	500 W	280 mV	PBR500PS28B							
36 V	11.12 A	13.89 A				1	1	1							400 W	500 W
48 V	8.34 A	10.42 A	1				480 mV	PBR500PS48B								
57 V	7.02 A	8.78 A					570 mV	PBR500PS57B								

Notes

- 1. For covered version, replace B in the part number with C, e.g PBR500PS12C. V3 not available on covered version.
- 2. 350-400 W without moving air or 450-500 W with 30 CFM forced air provided by the user. 450-500 W for '-C' version
- 3. Ripple and noise is the maximum peak-to-peak voltage value measured at the output with 20 MHz bandwidth, at rated line voltage and output load, and with a 10 μF tantalum capacitor in parallel with a 0.1 μF ceramic capacitor.
- 4. All models may be operated at no-load without damage. At no load, output voltage fluctuates beyond 5% due to burst-mode operation of the control IC for energy saving.

Temperature Derating Curve



PBR500 Series





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Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	80		264	VAC	Derate to 90% at 85 VAC & 80%at 80 VAC
Input Frequency	47		63	Hz	
Input Current - Full Load		5.2/2.6		A (rms)	115/230 VAC, 60/50 Hz
Earth Leakage Current		200	250	μA	264 VAC, 63 Hz

Outpu

Colpoi					
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage (V1)	12		57	VDC	See Models and Ratings table
Tolerance			±2	%	Line and Load Regulation, 0.1% minimum load required to meet specification
Transient Response			4	%	Recovery within 1% in less than 500 μs for a 25% step load change
Ripple & Noise			1	% pk-pk	20 MHz bandwidth, see model table notes
Overvoltage Protection	112		140	%	Latching
Overcurrent Protection	115		140	%	Trip & restart characteristic
Thermal Shutdown					Protected for overtemperature conditions, latching
Temperature Coefficient			±0.04	%/°C	
5 V Standby Supply (V2)			5	V	At 500 mA
Fan Supply (V3)			12	V	At 300 mA
Patient Leakage Current		50	80	μΑ	264 VAC, 63 Hz

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-10		+70	°C	Derate Linearly from 100% load at +50 °C to 50% load at +70 °C
Storage Temperature	-40		+85	°C	
Humidity	5		95	%RH	Non-condensing

General

Characteristic		Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency			90		%	230 VAC, 100% load
	Input to Output	4000			VAC	2 x MOPP
Isolation	Input to Ground	1500			VAC	1 X MOPP
	Output to Ground	1500			VAC	1 X MOPP
	PFC	55	65	75		Fixed
Switching Frequency	Main Converter	90		300	kHz	Variable
	Standby Converter	80		120		Variable
Hold Up Time		20			ms	At 110 VAC & 500 W
Inrush Current			30/60		VAC	115 VAC/230 VAC at 25 °C, cold start
Mean Time Between Failure			100,000		Hrs	MIL-HDBK-217F, Full load at 25 °C GB
Weight			2.23 (1011.5)		lb (g)	PBR500PSxx
VVGIGITE			2.52 (1143.0)		ib (g)	PBR500PSxx-C





Signals & Controls

Characteristic	Notes & Conditions
Remote Sense	Compensates for 0.5 V total voltage drop.
Inhibit	The inhibit, apply TTL high signal.
AC OK	TTL high for normal operation, low upon loss of input power, turn-on delay time 100-1000 ms, turn-off delay time 1 ms minimum.

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55011/EN55032	Class B	
Radiated	EN55011/EN55032	Class B	
Harmonic Current	EN61000-3-2	Class A	
Voltage Fluctuations	EN61000-3-3		

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	4	Α	±8 kV contact, ±15 kV air
Radiated	EN61000-4-3	10 V/m	Α	
EFT	EN61000-4-4	±2 kV	Α	
Surges	EN61000-4-5	Installation class 3	А	±1 kV differential/ ±2 kV common mode
Conducted	EN61000-4-6	10 Vrms	А	
Magnetic Field	EN61000-4-8	30 A/m	А	
		Dip 30% (70 VAC), 500ms	Α	
		Dip 60% (40 VAC), 100ms	В	
	400 W (100 VAC/60 Hz)	Int >95% (0 VAC), 10ms	Α	
	(100 VAO/00 112)	Int 100% (0 VAC), 20ms	А	
		Int 100% (0 VAC), 5000ms	В	
		Dip 30% (161 VAC), 500ms	А	
		Dip 60% (92 VAC), 100ms	А	
	400 W (230 VAC/50 Hz)	Int >95% (0 VAC), 10ms	Α	
	(200 17 (07 00 112)	Int 100% (0 VAC), 20ms	Α	
Ding and Interwentians		Int 100% (0 VAC), 5000ms	В	
Dips and Interruptions		Dip 30% (70 VAC), 500ms	А	
		Dip 60% (40 VAC), 100ms	В	
	500 W (100 VAC/60 Hz)	Int >95% (0 VAC), 10ms	А	
	(100 1/10/00 112)	Int 100% (0 VAC), 20ms	Α	
		Int 100% (0 VAC), 5000ms	В	
		Dip 30% (161 VAC), 500ms	Α	
		Dip 60% (92 VAC), 100ms	Α	
	500 W (230 VAC/50 Hz)	Int >95% (0 VAC), 10ms	А	
	(200 VAO/30 112)	Int 100% (0 VAC), 20ms	Α	
		Int 100% (0 VAC), 5000ms	В	

Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
CB Report	IEC62368-1	Information Technology
OB Report	IEC60601-1	Medical
UL	ES60601-1, CSA C22.2 No.60601-1	Medical
l or	UL62368-1, CSA C22.2 No. 62368-1	Information Technology
TUV	EN60601-1	Medical
100	EN62368-1	Information Technology



Mechanical Details

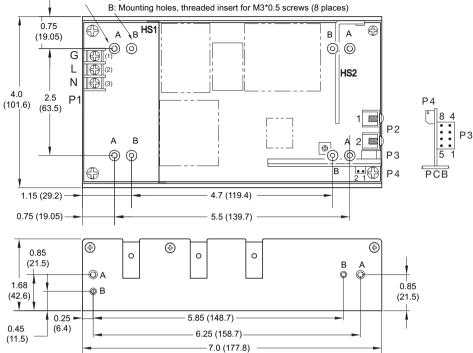
PBR500PSxxB

PBR500PSxxC

A: Mounting holes, threaded insert for #6-32 screws (8 places)

A: Mounting holes, threaded insert for #6-32 screws (8 places)

B: Mounting holes, threaded insert for M3*0.5 screws (8 places)



Input Connector - P1				
Pin 1	G			
Pin 2	L			
Pin 3	N			

Output Connector - P2				
Pin 1	V1+			
Pin 2	V1 Return			

P3			
Pin 1	Common Return		
Pin 2	+V1 Sense		
Pin 3	-V1 Sense		
Pin 4	AC OK		
Pin 5	Inhibit		
Pin 6	+5V Standby		
Pin 7	N/C		
Pin 8	N/C		

Output Connector - P4		
Pin 1	Common Return	
Pin 2	+V3	

0.75 (19.05) A B G C (101.6) (63.5) A B O (3) A B O (3) A B O (5) A B O (5) A B O (5) A B O (5) A B	B A © ©	P2 P3 P3 PCB
0.75 (19.05)	5.5 (139.7)	
1.70 (43.2) 0.85 (21.5) 0 B	B A	0.85 (21.5)
*	5.85 (148.7)	I 7

6.25 (158.7)

-7.0 (177.8)

Notes

- 1. Dimensions shown in inches [mm]
- 2. Tolerance 0.02 [0.5] maximum
- 3. Input connector P1 is Dinkle terminal P/N DT-35C-B01W-03, with nickel plated M3 screws.
- 4. Output connector P2 is M4x0.7 screw connections.

0.45

(11.5)

- Connector P3 is Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
- Fan connector P4 is JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
- Weight: 1.0 Kg (2.23 lbs.) approx. for U-bracket form, 1.14 Kgs. (2.52 lbs.) approx. for enclosed form
- 8. Maximum penetration of fixing screws is 4 mm from the outer surface of chassis.